IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#12 Green 9.2002

In re patent application of:	) Art Unit: 2874
Benson Chan et al	) Examiner: Juliana K. Kang
Serial No.: 09/481,903	) Date: July 12, 2002
Filed: January 12, 2000	) Atty. Docket No.: EN999025
For: FIBER OPTIC CONNECTION AND METHOD USING THE SAME	)

VERIFIED STATEMENT AND AFFIDAVIT

UNDER 37 C.F.R. §1.131

Honorable Commissioner of Patents and Trademarks
Washington, DC 20231

S I R:

County of Broome)
State of New York)

I, Benson Chan, being duly sworn, depose and state:

1. I am an applicant of the above-identified patent application and co-inventor of the subject matter described and claimed therein.

2. In early 1998, we were assigned the particular problem of designing a structure to couple a 12 channel wide fiber optic cable to a 12 channel VCSEL (laser) transmitter and a 12 channel PAID receiver die. The structure or package was intended to attach (solder) directly to an end user card and have the cables plugged directly through the tail stock of the card.

3. In an Office Action dated April 10, 2002, Examiner Juliana Kang cited a reference against the instant application: United States Patent No. 6,318,909 for INTEGRATED PACKAGING SYSTEM FOR OPTICAL COMMUNICATIONS DEVICES THAT PROVIDES AUTOMATIC ALIGNMENT WITH OPTICAL FIBERS, issued November 20, 2001 to Giboney et al and filed on February 11, 1999.

4. Be it known that I conceived and helped reduce to practice our instant invention prior to the issuance or filing dates of Giboney et al.

5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title

18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

AFFIANT FURTHER SAYETH NOT:

Benson Chan 8/23/02

Before me this 23 day of ~~July~~ August 02, 2002, appeared the affiant, Benson Chan.

Sworn to and subscribed before me on this 23 day of ~~July~~ August 02, 2002.

Notary Public

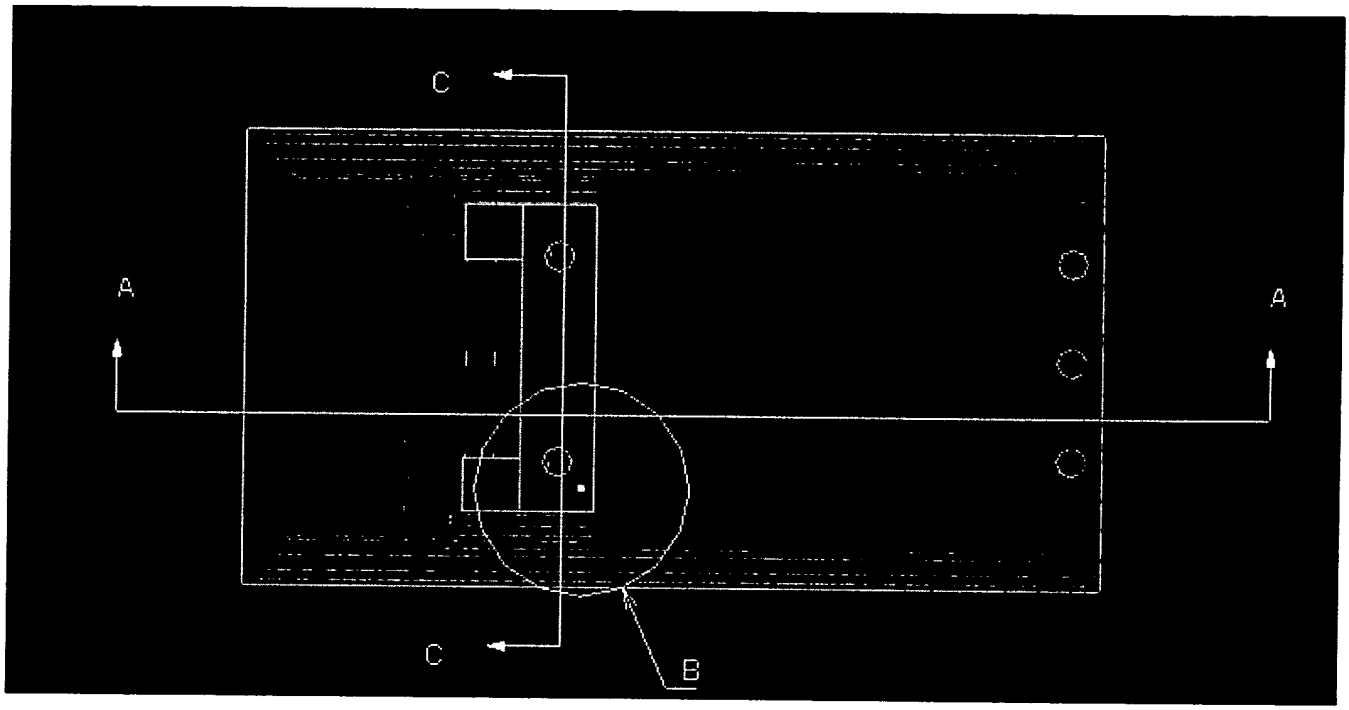
GEORGIA Y. BRUNDEGE
Notary Public, State of New York
No. 4754549
Residing in Broome County
My commission expires 5-31-05

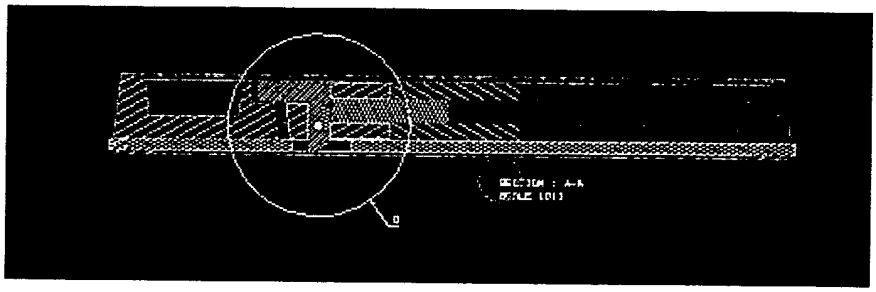
Benson Chan 01/15/1998 04:15 PM

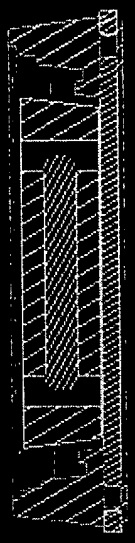
To: Glen W Johnson/Watson/IBM
cc: John Sherman/Endicott/IBM@IBMUS
From: Benson Chan/Endicott/IBM @ ibmus
Subject: Design status

Glen,

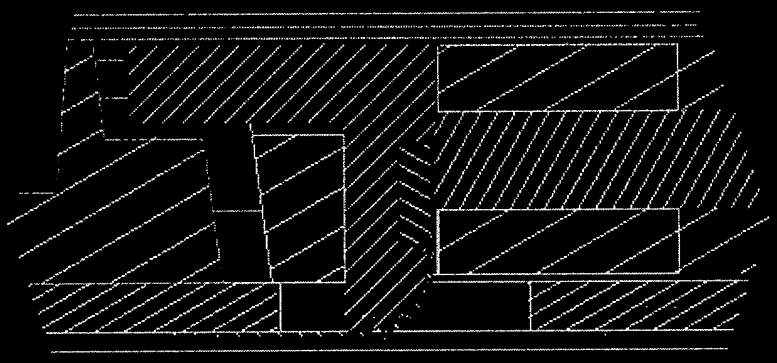
These are the views from the CATIA model that John Sherman is working on.



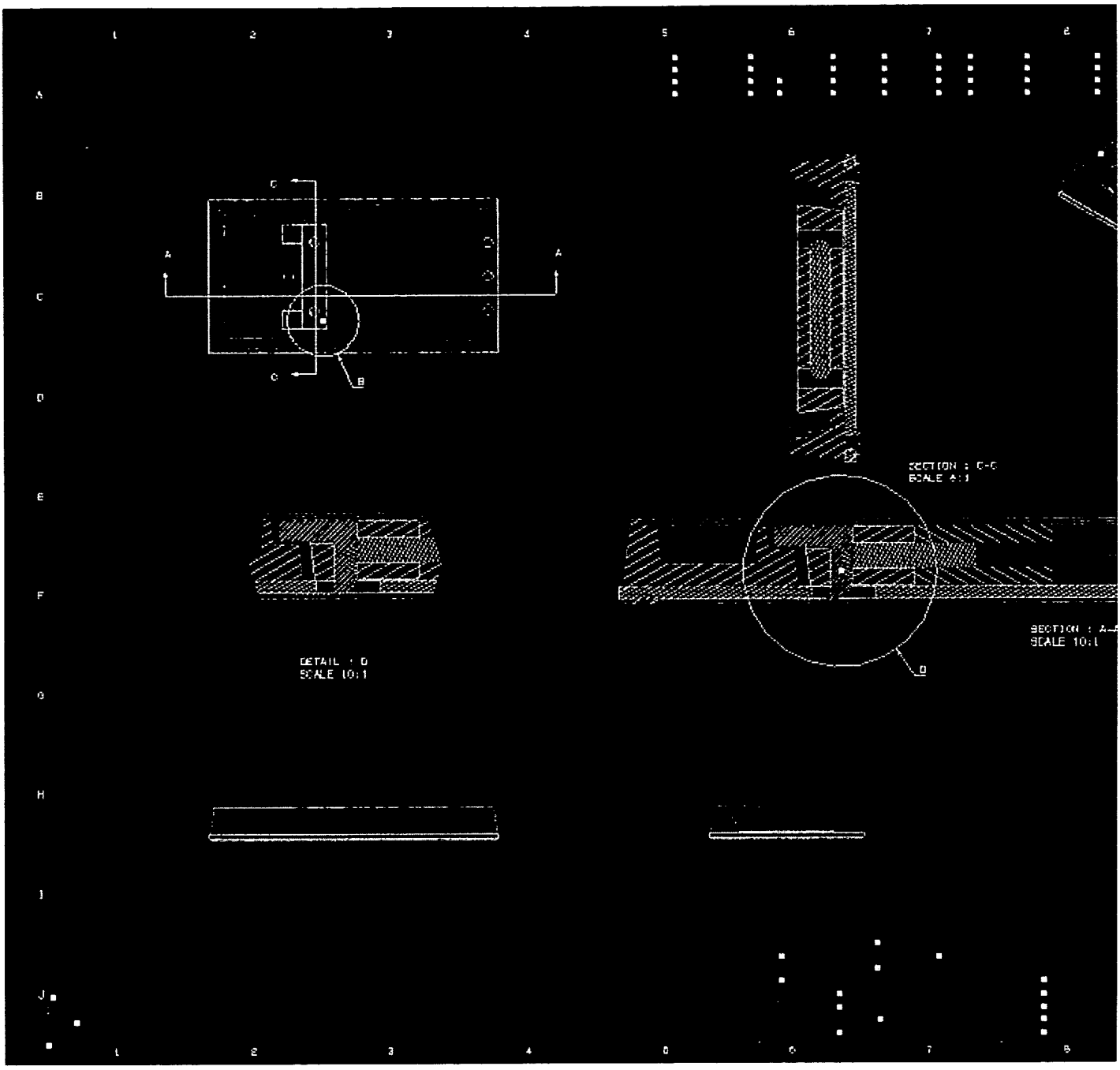


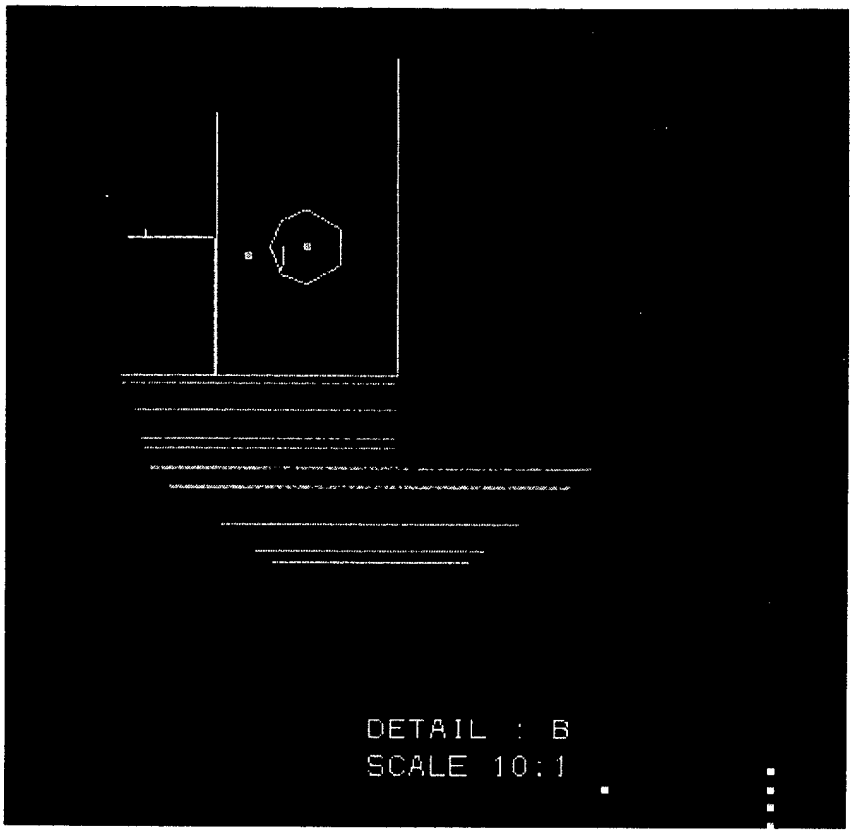


SECTION : C-C
SCALE 0:1



DETAIL : D
SCALE 10:1


A
A
B
C
C
B
DETAIL : B
SCALE 10:1
SECTION : C-C
SCALE 4:1
B



Regards,
Benson Chan

Connector Homepage http://endwww.endicott.ibm.com/site/appdev/ahpc/index.html
IBM Microelectronics - Advanced High Performace Connector Development
Dept U26 / Bldg 028-2 Tel(607)755-6546 / Fax(607)757-7125 / Tie line 855-6546

Paul Fortier@BROMONT

08/16/2002 12:32 PM

This document expires on 11/14/2002

To: Benson Chan/Endicott/IBM@IBMUS
cc:
From: Paul Fortier/Bromont@Bromont
Subject: Litebus patent stuff

Benson, here are some early 1998 notes I found. Again, I have a lot of stuff in my workbook, notes/sketches from early design reviews, even a Sherman catia print of the module dated 6MAR98. Let me know if you need more implication my me. See ya,

Flex sketch

Gary Galli@IBMUS
03-02-1998 10:02

To: Paul Fortier/Bromont/IBM@IBMCA
cc:
From: Gary Galli/Endicott/IBM @ ibmus
Subject: flex drawing

fyi,

Gary T. Galli
IBM Corp. Office - 607-757-4618
1701 North St. Fax - 607-757-4621
Endicott, NY 13760 Tie Line - 857
Dept. HPHE, BLDG. 40-3

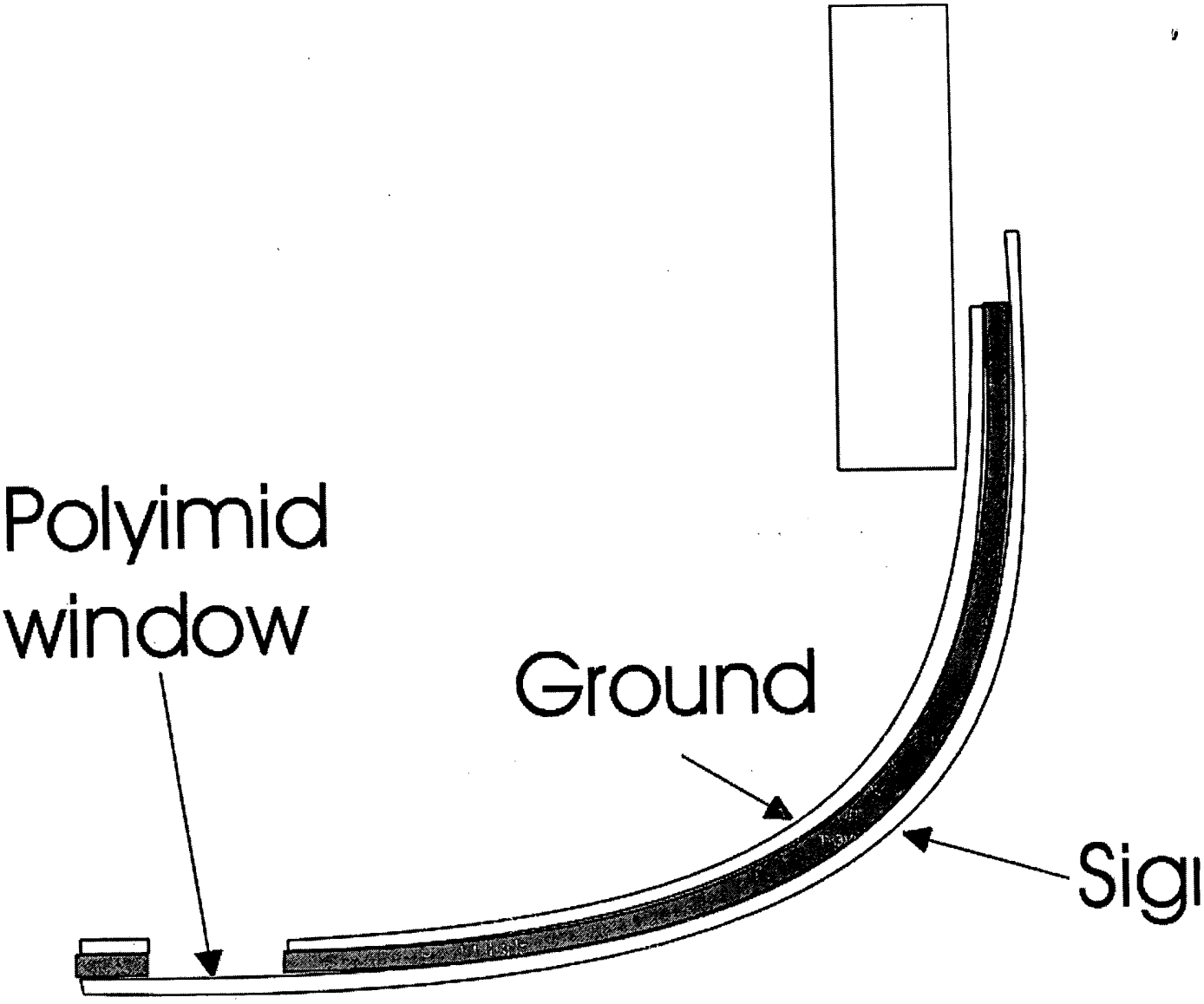
E-Mail ID - Galli@us.ibm.com
Internal Lotus Notes ID - Galli@ibmusm09

---------- Forwarded by Gary Galli/Endicott/IBM on 03-02-98 10:01 AM ----------

Benson Chan 02-23-98 05:39 PM

To: John Sherman/Endicott/IBM@IBMUS
cc: Gary Galli/Endicott/IBM@IBMUS, Ladd Freitag/Rochester/IBM@IBMUS
From: Benson Chan/Endicott/IBM @ ibmus
Subject: flex drawing

Gary would like to get a section view of the flex along with a layout so that he can send it to 3M for quoting. We discussed the fact that the direction is to go with therman compression bonding, this means that for the chip end (100 micron pitch) that the leads be cantilevered (sticking out of the flex unsupported). The end that will connect to the laminate will also be thermal compression bonded, this means that the flex will have a window through the ground plane that will expose the signal lines, the end of the flex will be copper and polyimid.



Regards,
Benson Chan

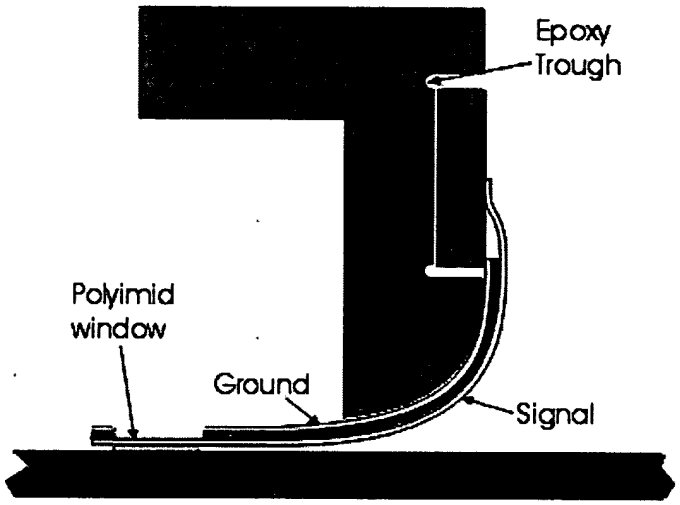
OSA design

Benson Chan@IBMUS 03-04-1998 13:55

To: Paul Fortier/Bromont/IBM@IBMCA, Glen W Johnson/Watson/IBM@IBMUS
cc: John Sherman/Endicott/IBM@IBMUS
From: Benson Chan/Endicott/IBM @ ibmus
Subject:

Paul,

I think that we may be able to keep the trough from going under the die but it will depend on your placement tolerances. Please confirm that the tolerances of 100 microns is 100 microns total or +/- 100 microns.



Regards,
Benson Chan

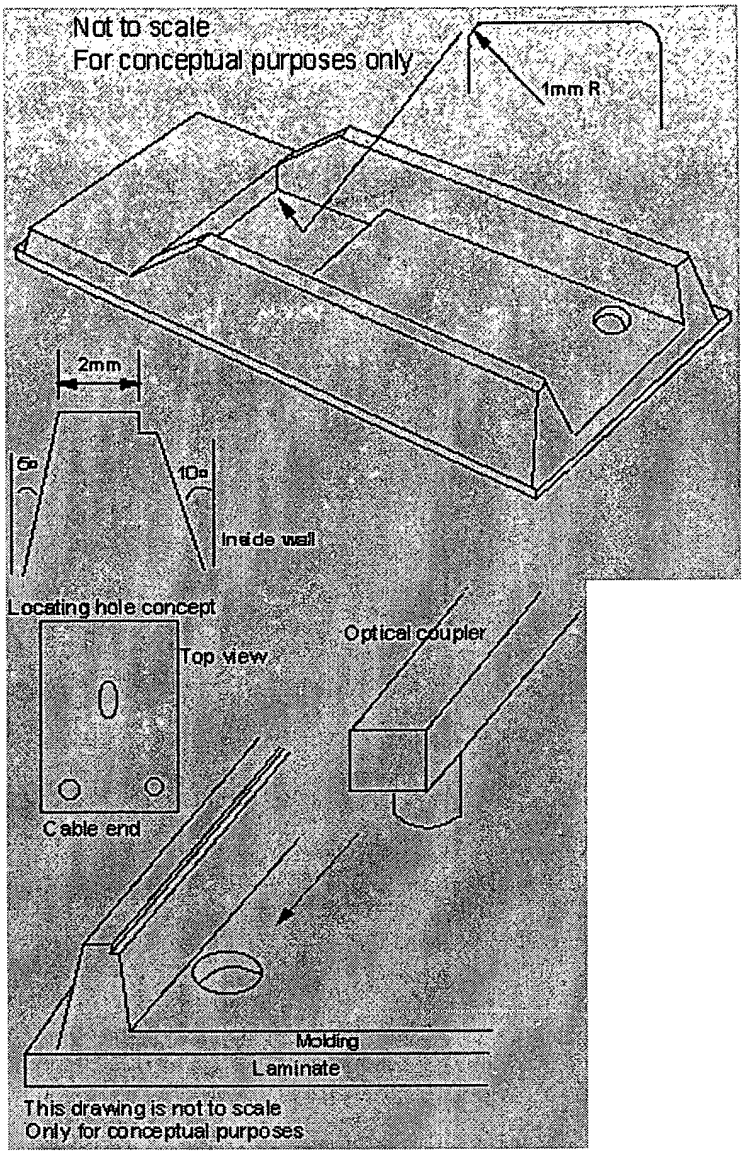
Overmold sketch

To: Glen W Johnson/Watson/IBM@IBMUS, Ladd Freitag/Rochester/IBM@IBMUS, Mark Hoffmeyer/Rochester/IBM@IBMUS, Benson Chan/Endicott/IBM@IBMUS
cc: Andre Lacerte/Bromont/IBM@IBMCA, Real Tetreault/Bromont/IBM@IBMCA, Marie-Claude Paquet/Bromont/IBM@IBMCA, Alain Tremblay/Bromont/IBM@IBMCA
Subject: LITEBUS - overmolding proposal

Here is a proposal (concept) to render the over-molding process more manufacturable. This has been reviewed with Glen and it has been decided that this shall be pursued/expanded upon.

Major points:

- Simplify molded wall profile. Fiber optic coupler system will align via holes in compound floor. Coupler will have mating part for hole. 2mm diam or more?
- Wrap around walls in front (where cable enters) are no longer needed
- Inside walls to have 10 deg draft angle, while outside wall to have 5-7 deg
- Top of wall should be 2mm wide minimum. This is to allow enough access for cleaning process. If needed we can attempt to push this dimension to 1.5mm.
- Inside pocket to have 1mm R minimum in corners

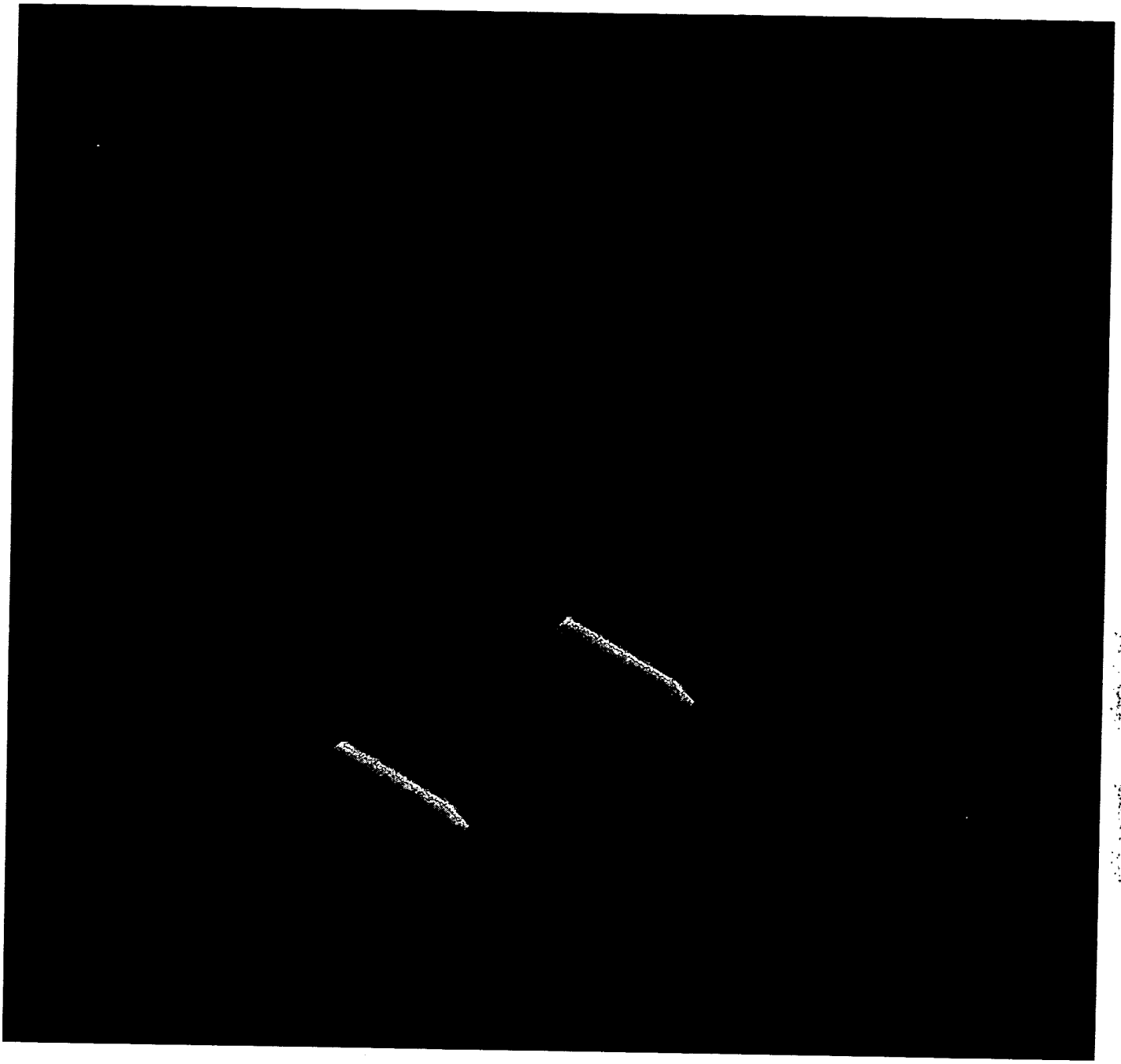


OSA with coupler

Benson Chan@IBMUS 03-23-1998 11:22

To: litebus
cc: rrhall, Gary Galli/Endicott/IBM
From: Benson Chan/Endicott/IBM @ ibmus
Subject: Updates to "passive - align" design

This is the latest images of John Sherman's work on the coupler subassembly. Comments.



Mold sketch

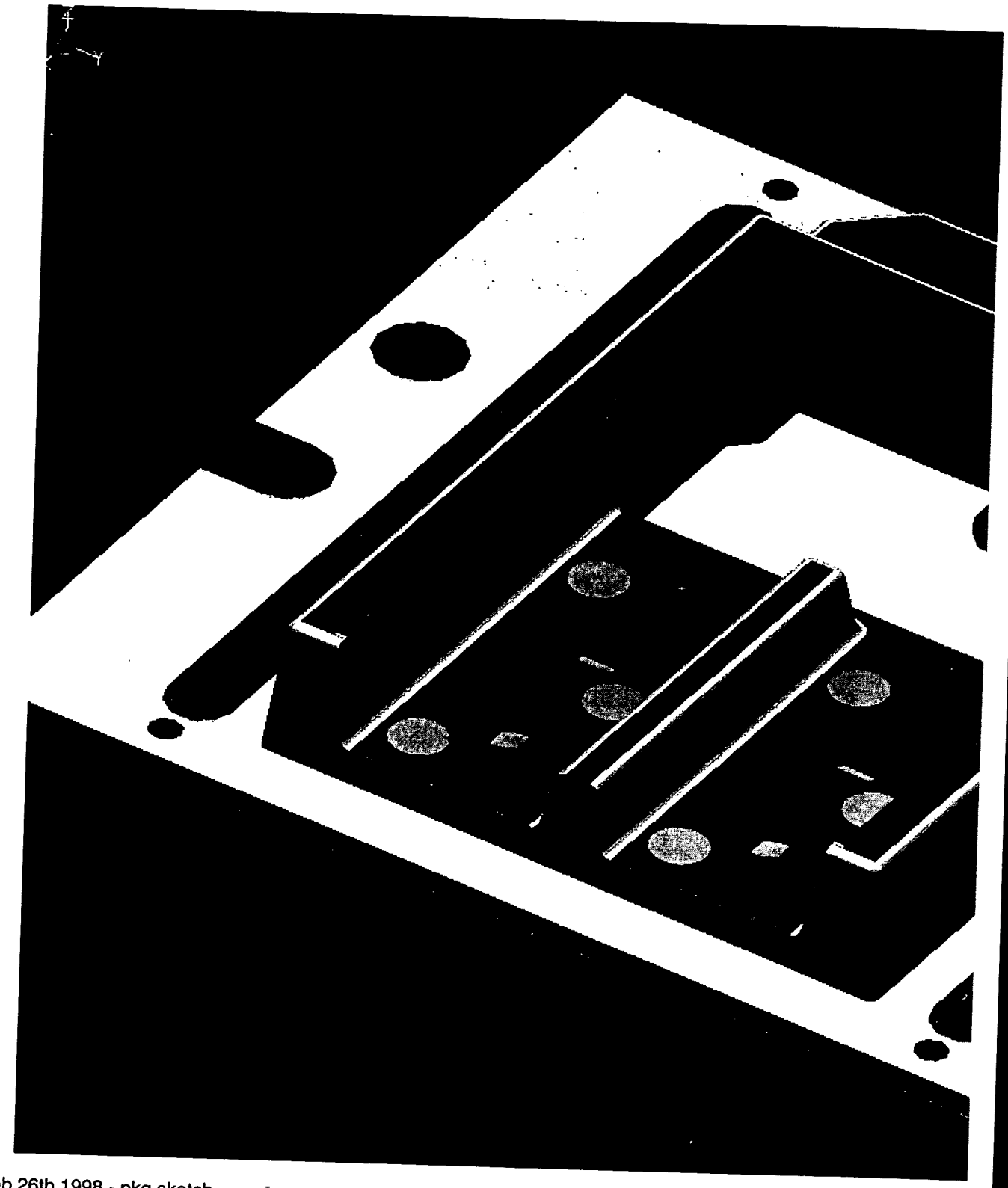
To: litebus
cc: Real Tetreault/Bromont/IBM@IBMCA, Marie-Claude Paquet/Bromont/IBM@IBMCA, Frank Brault/Bromont/IBM@IBMCA, Sylvain Ouimet/Bromont/IBM@IBMCA
From: Paul Fortier/Bromont/IBM @ IBMCA
Subject: Litebus - mold package

The following picture shows how the molded pkg outline will look with the test mold. (see bottom of note)
John, I need to make a couple updates before I put the drawing in site misc (I will be out of the office until

Thursday, so it will be after that).
Benson, JUST TO CONFIRM THAT WE WILL GO FOR THE SINGULATED PARTS RATHER THAN THE STRIP. While designing the laminate please be sure to have 1.5mm extending all around the molded portion.

Some of the modifications from the mold outline received from John:

- Wall on Cmos side brought up to 6mm
- Molded features to grossly align the flex
  - Flex centers move in by approx. 0.676mm
- Most sharp corners now have radii
- Landing pads added to mold floor (for retainer Z stop)
- Various holes and slots for retainer X-Y positioning

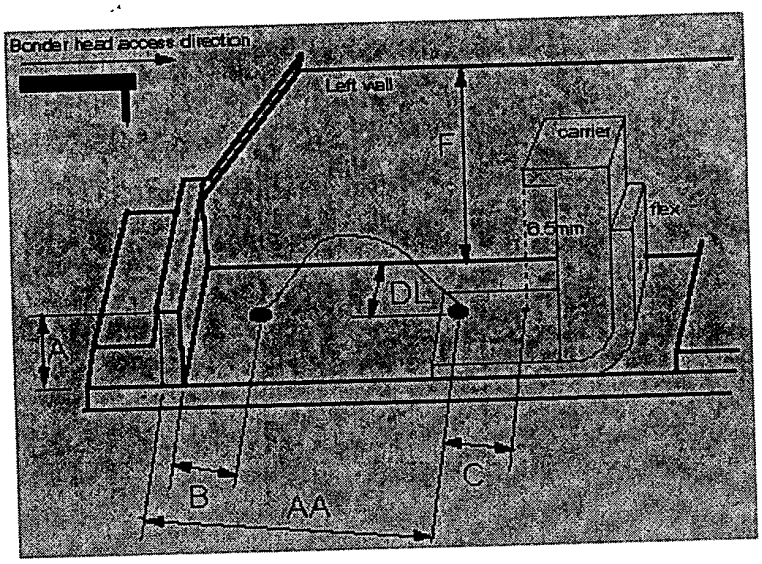


Feb 26th 1998 - pkg sketch

After revision of data with Glen and Brmt wirebonding, here is the new table (please discard the previous)
Changes are mostly due to the hi-freq ball bonding and revision of the Tab bonding hardware.

Measurements in mm	material	A	AA	B	C	DL	DR	F
Ball (hi-freq)	Au wire	6.0	na	1.5	2.6	1.5	4.0	6.5
Ball (hi-freq/lower F walls)	Au wire	6.0	na	1.5	2.6	1.5	1.5	6.0
Wedge A=1.25	Au or Al wire	1.25	na	1.5				6.5
Wedge A=3.5	Au or Al wire	3.5	na					6.5
Wedge (lower F walls)	Au or Al wire	3.5	na			3.5	3.5	3.5
Tab (ultrasound)	Au on Au	6.5	<3.5	1.5	2.3	1.5	1.5	6.5
Tab (ultrasound)	Au on Au	5	<12	1.5	2.3	1.5	1.5	5<F<6.5

Both measurements C and D require a safety factor due to flex placement tolerances.
DR and DL are distances to right wall and left wall.
AA is farthest access into pkg past A wall
Worst case are highlighted in red and come from the wedge bonding



Paul Fortier 534-7004, FAX 534-6961, Tie-line 552.
IBM Bromont - Optoelectronic and Organic Packaging Engineering
pfortier@ca.ibm.com